

ANTHER GLANDULARITY IN THE AMERICAN MYRTINAE (MYRTACEAE)

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ABSTRACT

A survey of anther glandularity in the American Myrtinae (Myrtaceae) (83 spp.) and related Myrtaceae (42 spp.) was conducted to discover any taxonomic tendencies that might exist. Of the larger genera, *Calycolpus* typically has 9–19 glands per anther in most species; *Campomanesia*, 0–1; *Mosiera*, 1–2; and *Psidium*, 1–4. Certain species differ greatly from the standard values for their genera. Thus, anther glandularity can be taxonomically valuable at both the generic and specific levels.

RESUMEN

Se hizo un estudio de glandularidad de anteras en Myrtinae (Myrtaceae) Americanas (83 spp.) y otras mirtáceas parientes (42 spp.) a fin de descubrir tendencias taxonómicas que podrían existir. En los géneros más grandes el número típico de glándulas por antera en la mayoría de las especies es: *Calycolpus* (9–19); *Campomanesia* (0–1); *Mosiera* (1–2); y *Psidium* (1–4). Algunas especies difieren bastante de los valores típicos de sus géneros. Así es que la glandularidad de anteras puede ser de valor taxonómico a nivel genérico o específico.

The American species of the subtribe Myrtinae (Myrtaceae) comprise a group of ca. 165 species in 15 genera. An approximately equal number of genera and species of Myrtinae are found in Australasia and a single species, *Myrtus communis*, is found in the Mediterranean region. The purpose of this study was to conduct a survey of anther glandularity in American Myrtinae. Preliminary observations had indicated that anther glandularity might be of taxonomic value in this group at either the generic or specific level. Landrum (1989) used it as an aid in placing the anomalous species *Myrtus alternifolia* in *Calycolpus*, and had also found it a useful character in distinguishing *Campomanesia speciosa* from other species of that genus (Landrum 1986).

METHODS

Anthers were extracted from 299 herbarium specimens of 125 species of Myrtaceae. Most (83 spp.) belonged to American Myr-

tinae but representative species of other subtribes and Old World Myrtinae were also sampled. Anthers were soaked in bleach (5.25% sodium hypochlorite) for about 15 minutes until relatively white. They were rinsed in water or mounted directly on glass slides with water and covered with a cover slip. Sometimes a little pressure was applied to the cover slip. Slides were observed immediately at 100 \times . The glands do not change color in the short time the anthers soak in bleach, but rather remain a light yellow-brown to reddish-brown color, their contents not readily mixing with water. They stand out clearly in contrast to the whitened tissue of the rest of the anther and can usually be easily counted (Fig. 1). The tissue of the anther softens in the bleach, so care has to be taken not to leave the anthers in the bleach too long. Anthers that become too soft can easily fall apart. Five anthers were observed for each specimen and a sketch was made of a representative. Counts for the five anthers were averaged.

RESULTS

Results of this study are summarized in Table 1 and are provided in a more complete form in Appendix A. The mean number of glands per anther varies essentially continuously from zero in several species (e.g., *Pimenta racemosa*) to over 60 in *Calycolpus warscewiczianus*. In Table 1 the continuum was broken arbitrarily into five categories of mean number of glands per anther: A, 0–0.9; B, 1.0–1.9; C, 2.0–3.9; D, 4.0–9.9; E, 10.0 or more. For any particular species one to several specimens were sampled. A letter in Table 1 may represent one to a several specimens. By simple observation one can see, for instance, that species of *Calycolpus* tend to be in the D to E range, species of *Campomanesia* and *Mosiera* tend to lie in the A to B range, and species of *Psidium* are mainly in the B to D range. Certain contrasts are evident. Within *Calycopuss*, one species, *C. legrandii* stands out by having anthers with one or no glands and in *Campomanesia*, a single species is conspicuous by having several glands. The closely related genera *Acca* and *Myrrhinium* (Landrum 1986) differ widely in gland number.

In *Psidium*, most species have a moderate number of glands, but there seem to be three complexes of species that sometimes have numerous glands: *P. guineense*; *P. acutangulum* and *P. friedrichsthalianum*, closely related species of South and Central America respectively; and the Caribbean complex of *P. amplexicaule*, *P. cymosum*, and *P. dictyophyllum*.

The four species of Old World Myrtinae sampled fell within the B and D ranges. Of the 18 American Eugeniinae sampled, 16 fell in the A to B range, and only three specimens had any anthers with more than one gland. Of the 16 American Myrciinae sampled, all

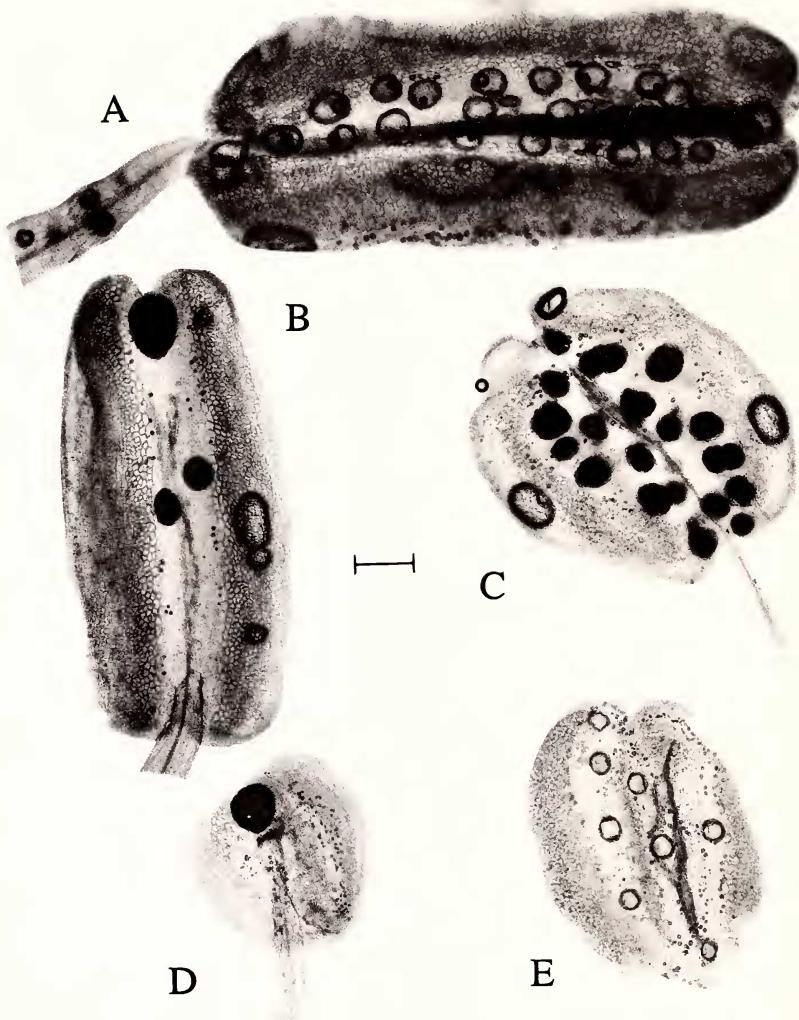


FIG. 1. Anthers of American Myrtinae. A. *Calycolpus moritzianus* (Grifo & Hahn 338A, MO). B. *Psidium guineense* (Landrum 5678, ASU). C. *Campomanesia speciosa* (Morawetz & Wallnofer 11-30985, ASU). D. *Campomanesia guaviroba* (Kummrow 2833, ASU). E. *Myrrhinium atropurpureum* (Silva 200, ASU). Bar = 0.1 mm in B, C and E and = 0.2 mm in A and D. Colorless bubbles are present in B on the right side and in C near the apex and on both sides. They are easily distinguished from glands when color is evident.

TABLE 1. SUMMARY OF ANTER GLANDULARITY IN AMERICAN MYRTINAE. Species are classified as to the mean number of glands in the anther connectives. A, 0-0.9. B, 1.0-1.9. C, 2.0-3.9. D, 4.0-9.9. E, 10.0 or more. Each letter in the table represents at least one specimen. See appendix for more complete data.

	A	B	C	D	E
<i>Acca macrostema</i>	A				
<i>Acca sellowiana</i>	A	B			
<i>Amomyrtella guili</i>	A				
<i>Amomyrtus luma</i>	A				
<i>Amomyrtus meli</i>	A				
<i>Blepharocalyx cruckshanksii</i>		B			
<i>Blepharocalyx salicifolius</i>		B			
<i>Calycolpus alternifolius</i>			C	D	E
<i>Calycolpus boliviensis</i>				D	
<i>Calycolpus calophyllus</i>					E
<i>Calycolpus goetheanus</i>					E
<i>Calycolpus legrandii</i>	A				
<i>Calycolpus moritzianus</i>					E
<i>Calycolpus revolutus</i>				D	E
<i>Calycolpus surinamensis</i>					E
<i>Calycolpus warszewiczianus</i>					E
<i>Campomanesia adamantium</i>	A				
<i>Campomanesia aurea</i>		B			
<i>Campomanesia espiritosantensis</i>		B			
<i>Campomanesia eugenoides</i>		B			
<i>Campomanesia grandiflora</i>		B			
<i>Campomanesia guaviroba</i>		B			
<i>Campomanesia guazumaefolia</i>		B			
<i>Campomanesia laurifolia</i>	A				
<i>Campomanesia neriflora</i>		B			
<i>Campomanesia pubescens</i>	A				
<i>Campomanesia sessiliflora</i>		B			
<i>Campomanesia speciosa</i>					E
<i>Campomanesia velutina</i>	A				
<i>Campomanesia viatoris</i>	A				
<i>Campomanesia xanthocarpa</i>	A	B			
<i>Chamguava gentlei</i>		B	C	D	
<i>Chamguava schippii</i>	A				
<i>Legrandia concinna</i>	A				
<i>Mosiera bullata</i>		B			
<i>Mosiera contrerasii</i>		B			
<i>Mosiera ehrenbergii</i>	A		C		
<i>Mosiera longipes</i>		B			
<i>Mosiera moaensis</i>		B			
<i>Moseira ophiticola</i>		B			
“ <i>Psidium</i> ” <i>saxicola</i>		B			
“ <i>Eugenia</i> ” <i>xerophytica</i>		B			
<i>Myrrhinium atropurpureum</i>					E
<i>Myrtleola acerosa</i>		B			
<i>Myrtleola nummularia</i>		B			
<i>Myrtleola phylloides</i>		B			
<i>Pimenta dioica</i>		B			
<i>Pimenta pseudocaryophyllus</i>		B			
<i>Pimenta racemosa</i>	A				

TABLE 1. CONTINUED

	A	B	C	D	E
<i>Psidium acutangulum</i>	A	B	C		E
<i>Psidium amplexicaule</i>			C	D	E
<i>Psidium appendiculatum</i>	A				
<i>Psidium arayan</i>		B			
<i>Psidium australe</i>		B			
<i>Psidium cattleianum</i>		B			
<i>Psidium cinereum</i>		B	C		
<i>Psidium cuneatum</i>		B			
<i>Psidium cymosum</i>					E
<i>Psidium densicomum</i>		B	C		
<i>Psidium dictyophyllum</i>				D	
<i>Psidium firmum</i>		B			
<i>Psidium friedrichsthalianum</i>		B		D	E
<i>Psidium guajava</i>		B	C	D	
<i>Psidium guineense</i>		B	C	D	E
<i>Psidium kennedyanum</i>		B			
<i>Psidium laruotteanum</i>		B	C		
<i>Psidium longiperiolatum</i>		B	C		
<i>Psidium luridum</i>	A	B			
<i>Psidium maribense</i>		B	C		
<i>Psidium missionum</i>			C	D	
<i>Psidium montanum</i>			C	D	
<i>Psidium multiflorum</i>			C		
<i>Psidium myrsinthes</i>			C	D	
<i>Psidium persoonii</i>		B	C	D	
<i>Psidium riparium</i>		B	C		
<i>Psidium rufum</i>		B		D	
<i>Psidium salutare</i>		B	C		
<i>Psidium sartorianum</i>		B	C		
<i>Psidium spatulatum</i>		B			
<i>Psidium striatum</i>		B	C		
<i>Ugni candollei</i>		B	C	D	
<i>Ugni moliniae</i>	A				
<i>Ugni myricoides</i>	A	B	C		

fell in the A to B range and none had more than one gland per anther. Larger samples of these enormous subtribes of hundreds of species will have to be made before any conclusions can be drawn, but the small sample in this study seems to indicate that highly glandular anthers may be a rarity in American Eugeniinae and Myrtinae.

Just as a mean number of glands per specimen was calculated, a mean for each species in the four principal genera of American Myrtinae was also calculated. The generic ranges of these species means are as follows: *Campomanesia*, 0-1.1, excluding *C. speciosa* with 20.9; *Mosiera*, 1-1.8; *Calycolpus*, 9.3-18.9, excluding *Calycolpus legrandii* with 0.2 and *Calycolpus warscewiczianus* with 65.4; and *Psidium*, with 1-4 in most species, but with 0 in *Psidium*

appendiculatum, and a few species with means exceeding 4, viz., *P. montanum* (5.5), *P. amplexicaule* (5.7), *P. dyctophyllum* (7.2), *P. cymosum* (11.2), *P. friedrichsthalianum* (11.6), and *P. guineense* (13.2).

DISCUSSION

To our knowledge, anther glandularity has never been used taxonomically in the Myrtaceae before except for the studies by Landrum cited above. With this survey we have found that it can be an important character at the generic and specific level. Additional surveys in the family should prove interesting.

Studies of anther glandularity have the advantage of being inexpensive to conduct and cause little damage to herbarium specimens, which normally have numerous anthers in flowering specimens. A survey could easily be included as a part of monographic studies.

What is the purpose of glands in anthers? Three potential answers occur to us. 1) the glands may provide a floral aroma; 2) they may be a protection against insects that eat anthers; or 3) their contents may be a food source for insect visitors as has been hypothesized for *Thryptomene calycina* (Lindl.) Stapf (Myrtaceae) by Beardsell et al. (1989) and for *Prosopis juliflora* (Sw.) DC. (Leguminosae) by Chaudhry and Vijayaraghavan (1992). Studies of insects visiting flowers of *Campomanesia* and *Calycolpus* might provide answers, because these genera differ markedly in anther glandularity. *Psidium guineense*, a widespread and variable species might also be of interest, because it varies more in anther glandularity than any other in the genus.

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APPENDIX A

Each specimen is identified by collector, collection number, and herbarium. The highest and lowest of five counts are given first (if these are the same, only a single number is given), followed by the average of five counts. Thus, "1, 1.0" means all anthers had a single gland; "0–1, 0.8" means that anthers had zero to 1 gland and that the mean number for the specimen was 0.8.

AMERICAN MYRTINAE

Acca macrostema (Ruiz & Pavón ex G. Don) McVaugh: *Smith & Buddensiek* 10860 (ASU), 1, 1.0; *Valencia* 1627 (ASU), 1, 1.0.

Acca sellowiana (Berg) Burret: *Lehto* 5942b (ASU), 1, 1.0; *Viana et al.* 8218 (ASU), 1, 1.0; *Wasum et al.* 4757 (ASU), 0–1, 0.8.

Amomyrtella guili (Sprengel) Kausel: *Legname & Cuezzo* 9640 (US), 0–1, 0.2; *Solomon* 11018 (CAS), 0–1, 0.6.

Amomyrtus luma (Molina) Legrand & Kausel: *Landrum* 7606 (ASU), 0–1, 0.2; *Landrum* 8099 (ASU), 0–1, 0.2; *Landrum* 8157 (ASU), 0, 0.0.

Amomyrtus meli (Philippi) Legrand & Kausel: *Landrum* 8098 (ASU), 0, 0.0.

Blepharocalyx cruckshanksii (Hook. & Arn.) Niedenzu: *Gardner & Page* 4982 (ASU), 1, 1.0; *Landrum* 5861 (ASU), 1, 1.0; *Landrum* 5873 (ASU), 1, 1.0.

Blepharocalyx salicifolius (Kunth) Berg: *Hatschbach* 28095 (ASU), 1, 1.0; *Hatschbach* 53600 (ASU), 1, 1.0; *Zardini* 7806 (ASU), 1, 1.0.

Calycolpus alternifolius (Gleason) Landrum: *Do Amaral* 1516 (ASU), 6–9, 7.4; *Holst* 3748 (ASU), 7–11, 9.0; *Huber et al.* 10206 (ASU), 6–9, 8.4; *Maguire & Politi* 27521 (MICH), 0–4, 2.0; *Steyermark & Wurdack* 1200 (F), 14–22, 18.4; *Steyermark & Wurdack* 1200 (MICH), 21–26, 23.2.

Calycolpus boliviensis Landrum: *Fernández* 3068 (ASU), 8–11, 9.8.

Calycolpus calophyllus (Kunth) Berg: *Maguire & Wurdack* 35587 (MICH), 17–20, 18.2; *Maguire et al.* 36475 (NY), 11–20, 15.6; *Prance et al.* 30058 (ASU), 15–26, 20.0.

Calycolpus goetheanus (DC.) Berg: *Holst* 3029 (ASU), 16–19, 17.0; *Huber* 9312 (NY), 14–20, 17.0; *Philcox et al.* 7429 (NY), 10–13, 11.4.

Calycolpus legrandii Mattos: *Amorim et al.* 1513 (ASU), 0–1, 0.2; *Plowman* 12777 (NY), 0–1, 0.2.

Calycolpus moritzianus (Berg) Burret: *Aymard* 1027 (MO), 17–26, 19.8; *Grifo & Hahn* 338A (MO), 10–29, 18.2; *Zaruchi & Betancur* 6422 (ASU), 12–20, 18.6.

Calycolpus revolutus (Schauer) Berg: *B. W.* 4197 (US), 4–7, 5.8; *Cowan* 38859 (MICH), 11–15, 12.8; *Maas & Westra* 3519 (MICH), 6–14, 9.4.

Calycolpus surinamensis McVaugh: *Irwin et al.* 55186 (US), 12–19, 13.8; *Rosa* 231 (MICH), 20–27, 23.6.

Calycolpus warszewiczianus Berg: *de Nevers et al.* 7710 (ASU), 34–50, 40.6; *Dwyer et al.* 4705 (MICH), 62–84, 75.2; *Croat* 7682 (F), 62–72, 68.4; *Croat* 7682 (NY), 63–85, 77.2.

Campomanesia adamantium (Cambess.) Berg: *Gottsberger & Gottsberger* 22–25990 (ASU), 0, 0.0; *Gottsberger & Gottsberger* 22–25990 (ASU), 0, 0.0.

Campomanesia aurea Berg: *Wasum et al.* 4946 (ASU), 1, 1.0.

Campomanesia espiritosantensis Landrum: *Folli* 301 (ASU), 1, 1.0.

Campomanesia eugeniooides (Cambess.) Legrand: *Hatschbach & Hatschbach* 54629 (ASU), 1, 1.0.

Campomanesia grandiflora (Aublet) Sagot: *Acevedo* 3489 (ASU), 1, 1.0; *Silva* 1450 (ASU), 1, 1.0.

Campomanesia guaviroba (DC.) Kiaerskov: *Kummrow* 2833 (ASU), 1, 1.0; *Poli-guesi* 28 (ASU), 1–2, 1.4; *Silva* 380 (ASU), 1, 1.0.

Campomanesia guazumifolia (Cambess.) Berg: *Gentry et al.* 59409A (ASU), 1, 1.0; *Vanni & Cáceres* 675 (ASU), 1, 1.0; *Zardini & Velázquez* 15158 (ASU), 1, 1.0.

Campomanesia laurifolia Gardner: *Hatschbach* 48785 (ASU), 0, 0.0.

Campomanesia neriflora (Berg) Niedenzu: *Hatschbach* 49843 (ASU), 1, 1.0.
Campomanesia pubescens (DC.) Berg: *Gentry et al.* 59272 (ASU), 0, 0.0; *Gottsberger & Gottsberger* 15-141090 (ASU), 0, 0.0; *Gottsberger & Gottsberger* 32-41090 (ASU), 0, 0.0.

Campomanesia sessiliflora (Berg) Mattos: *Hatschbach* 48473 (ASU), 1, 1.0; *Hatschbach & Hatschbach* 52621 (ASU), 1-2, 1.4; *Pott* 5698 (ASU), 1, 1.0.

Campomanesia speciosa (Diels) McVaugh: *Foster* 11330 (ASU), 16-24, 20.2; *Morawetz & Wallnöfer* 11-30985 (ASU), 20-23, 21.6.

Campomanesia velutina (Cambess.) Berg: *Gottsberger & Gottsberger* 11-24990 (ASU), 0, 0.0; *Gottsberger & Gottsberger* 12-25990 (ASU), 0, 0.0; *Gottsberger & Gottsberger* 14-24990 (ASU), 0, 0.0.

Campomanesia viatoris Landrum: *Amorim et al.* 1500 (ASU), 0, 0.0.

Campomanesia xanthocarpa Berg: *Hatschbach* 52388 (ASU), 1, 1.0; *Jaster* 232 (ASU), 0, 0.0; *Kummrow* 3084 (ASU), 1, 1.0.

Chamguava gentlei (Lundell) Landrum: *Contreras* 10882 (ASU), 3-5, 3.6; *Gentle* 8552 (ASU), 1-2, 1.6; *Landrum* 6538 (ASU), 7-11, 8.4.

Chamguava schippii (Standley) Landrum: *Gentle* 8354 (ASU), 0, 0.0.

Legrandia concinna (Philippi) Kausel: *Landrum* 7628 (ASU), 0, 0.0.

Mosiera bullata (Britton & Wilson) Bisce: *Britton & Cowell* 13328 (F), 1, 1.0; *Britton et al.* 13246 (F), 1, 1.0.

Mosiera contrerasii (Lundell) Landrum: *Durán* 990 (MO), 1, 1.0.

Mosiera ehrenbergii (Berg) Landrum: *Johnston et al.* 11161 (NY), 0-1, 0.8; *Purpus* 5211 (UC), 2-3, 2.8.

Mosiera longipes (Berg) Small: *Curtis No. E* (GH), 1, 1.0; *Killip* 43241 (US), 1, 1.0; *Proctor* 9018 (GH), 1, 1.0.

Mosiera moensis (Britton & Wilson) Bisce: *Webster* 3795 (MICH), 1, 1.0.

Mosiera ophiticola (Britton & Wilson) Bisce: *Acuña* 12609 (NY), 1, 1.0; *Howard* 6003 (NY), 1, 1.0; *León et al.* 20240 (NY), 1, 1.0.

The following two species apparently belong to *Mosiera* but have not yet been transferred.

Psidium saxicola Britton & Wilson: *Clemente* 5340 (NY), 1, 1.0.

Eugenia xerophytica Britton: *Miller et al.* 6493 (ASU), 1, 1.0.

Myrrhinium atropurpureum Schott: *Kummrow* 2792 (ASU), 8-15, 11.4; *Silva* 200 (ASU), 18-23, 20.6; *Wasum & Brinker* 6265 (ASU), 20-26, 23.2.

Myrtleola acerosa (Berg) Burret: *Ferreira & Aclero* 15299 (ASU), 1, 1.0.

Myrtleola nummularia (Poiret) Berg: *Clemants et al.* 2245 (ASU), 1, 1.0.

Myrtleola phylloides (Benth.) Landrum: *Dillon et al.* 6442 (ASU), 1, 1.0; *Mostacero et al.* 1147 (ASU), 1, 1.0; *Stein* 2497 (ASU), 1, 1.0; *van der Werff & Palacios* 9455 (ASU), 1, 1.0.

Pimenta dioica (L.) Merr.: *Balick* 3135 (ASU), 1, 1.0; *Ihrig & Staples* 609 (ASU), 1, 1.0; *Martínez* 11774 (ASU), 1, 1.0.

Pimenta pseudocaryophyllus (Gomes) Landrum: *Poliguesi* 18 (ASU), 1, 1.0.

Pimenta racemosa (Mill.) J. Moore: *Ihrig & Staples* 608 (ASU), 0, 0.0; *Lau* 2416 (ASU), 0, 0.0.

Psidium acutangulum DC.: *Froes* 1927 (MICH), 1, 1.0; *Irwin et al.* 55388 (MICH), 1, 1.0; *Krukoff* 1089 (NY), 1-3, 2.0; *Prance & Silva* 58834 (MICH), 3-4, 3.8; *Prance et al.* 5917 (MICH), 0-1, 0.2; *Prance et al.* 14133 (MICH), 2-4, 3.6; *Prance et al.* 14133 (NY), 2-5, 3.6; *Revilla & Carrillo* 1503 (MICH), 10-14, 12.0; *Vázquez & Jaramillo* 9283 (ASU), 1, 1.0.

Psidium amplexicaule Pers.: *Ekman* 18861 (NY), 3-5, 4.0; *Fishlock* 94 (NY), 7-15, 10.0; *Smith* 10574 (MICH), 4-6, 5.0; *Smith* 10574 (NY), 3-5, 3.6.

Psidium appendiculatum Kiereskov: *Facultad de Ciencias Forestales s.n.* (NY), 0, 0.0.

Psidium arayan (Kunth) Burret: *Luteyn & Callejas* 11782 (ASU), 1, 1.0.

Psidium australe Cambess.: *Hatschbach* 50322 (ASU), 1, 1.0; *Hatschbach* & *Hatschbach* 55798 (ASU), 1, 1.0; *Silva* 739 (ASU), 1, 1.0.

Psidium cattleianum Sabine: *Krapovickas* & *Cristóbal* 43513 (ASU), 1, 1.0; *Rosato* & *Alii* 4861 (ASU), 1, 1.0.

Psidium cinereum Martius: *Harley* 26964 (ASU), 2-3, 2.8; *Hatschbach* 27710 (ASU), 2-3, 2.2; *Hatschbach* & *Hatschbach* 55874 (ASU), 1-2, 1.8; *Ribas* 199 (ASU), 2-3, 2.2.

Psidium cuneatum Cambess.: *Carnevali* 4947 (ASU), 1-3, 2.0; *Krapovickas* & *Cristóbal* 44444 (ASU), 1, 1.0; *Landrum* 5717 (ASU), 1-3, 1.6.

Psidium cymosum Urban: *Alain* 1194 (NY), 10-13, 11.2.

Psidium densicomum DC: *Ayala* 310 (ASU), 1-2, 1.2; *Cid* 4144 (ASU), 0-5, 2.0; *Gentry* & *Perry* 78002 (ASU), 2-4, 3.0.

Psidium dictyophyllum Urban & Ekman: *Zanoni* et al. 33501 (ASU), 6-9, 7.2.

Psidium firmum Berg: *Irwin* & *Soderstrom* 5129 (CAS), 1, 1.0.

Psidium friedrichsthalianum (Berg) Niedenzu: *Gríjalva* & *Gríjalva* 1777 (MO), 11-20, 15.6; *Guzmán* 1804 (MO), 15-18, 17.0; *Heyde* & *Lux* 2984 (MO), 8-13, 10.2; *Landrum* 6555 (ASU), 12-22, 15.6; *Marshall* & *Neill* 7093 (MO), 8-11, 9.8; *Matuda* 18733 (CAS), 12-15, 13.6; *Schmid* 1972-8 (MICH), 13-18, 15.2; *Skutch* 3989 (MO), 4-8, 5.8; *Woronow* & *Juzepczuk* 4865 (MO), 1-2, 1.8.

Psidium guajava L.: *Arvigo* 239 (ASU), 7-10, 8.4; *Boege* 475 (CAS), 1-2, 1.2; *Delgado* 150 (CAS), 2-4, 2.4; *Etienae* s.n. (CAS), 2-3, 2.2; *Hatschbach* & *Hatschbach* 52449 (ASU), 4-5, 4.4; *Hinton* 5637 (ASU), 2-4, 2.8; *Howell* 8457 (CAS), 1-2, 1.2; *Landrum* 5677 (ASU), 3-4, 3.4; *Landrum* 5681 (ASU), 1-3, 2.0; *Landrum* 5683 (ASU), 3-4, 3.2; *Landrum* 5684 (ASU), 2-5, 3.5; *Landrum* 5689 (ASU), 1-7, 3.6; *Landrum* 5690 (ASU), 3-4, 3.4; *Landrum* 5742 (ASU), 2-3, 2.6; *López* 1164 (CAS), 2-4, 2.8; *Nelson* & *Nelson* 5180 (DS), 1, 1.0; *Pipoli* 9058 (ASU), 5-7, 5.8; *Pipoli* 9096 (ASU), 3-6, 4.6; *Robertson* 12 (DS), 4-7, 6.0; *Skog* 1518 (CAS), 4-6, 4.8; *Torres* 201 (CAS), 3-4, 3.4.

Psidium guineense Sw.: *Allen* 1007 (MICH), 6-11, 9.0; *Bang* 287 (CAS), 5-10, 7.0; *Bang* 2831 (NY), 3-7, 4.8; *Brother Paul* 465 (MICH), 24-43, 34.4; *Harley* 26590 (ASU), 2-3, 2.2; *Hatschbach* 30415 (ASU), 3-6, 4.0; *Hatschbach* 54720 (ASU), 34-52, 46.0; *Irwin* et al. 21204 (MICH), 40-55, 46.6; *Jansen-Jacobs* 89 (ASU), 15-25, 18.6; *King* 593 (MICH), 6-12, 9.4; *Landrum* 5678 (ASU), 4-7, 5.8; *Landrum* 5679 (ASU), 4-7, 6.0; *Landrum* 5680 (ASU), 5-9, 7.0; *Landrum* 5708 (ASU), 5-6, 5.8; *Landrum* 7865 (ASU), 8-9, 8.4; *Longhi* et al. SPF34954 CFCR 5894 (ASU), 1-2, 1.0; *Maas* & *Maas* 500 (MICH), 5-12, 9.0; *Maguire* & *Maguire* 40214 (MICH), 10-14, 12.2; *Montes* 14792 (CAS), 0-5, 2.2; *Ribeiro* 1489 (CAS), 3-5, 4.0; *Tressens* et al. 3470 (ASU), 2-4, 3.4; *Witsberger* 847 (MICH), 12-23, 18.0.

Psidium guajava × *guineense*: *Landrum* 5682 (ASU), 3-4, 3.4; *Landrum* 5686 (ASU), 3-9, 6.4; *Landrum* 5695 (ASU), 4-9, 7.0.

Psidium kennedyanum Morong: *Hatschbach* & *Hatschbach* 52495 (ASU), 1, 1.0; *Zardini* & *Velázquez* 19804 (ASU), 1-2, 1.2.

Psidium laruotteanum Cambess.: *Gottsberger* & *Gottsberger* 11-141090 (ASU), 3-4, 3.4; *Harley* 26608 (ASU), 1, 1.0; *Hatschbach* & *Hatschbach* 53638 (ASU), 1, 1.0.

Psidium longipetiolatum Legrand: *Hatschbach* 15250 (NY), 2-4, 3.0. *Hatschbach* 15289 (NY), 1, 1.0; *Kuniyoshi* 4722 (ASU), 1, 1.0.

Psidium luridum (Sprengel) Burret: *Ekman* 2048 (MICH), 0-1, 0.6; *Ekman* 2048 (NY), 0-1, 0.4; *Hatschbach* 54810 (ASU), 0-1, 0.2; *Rosengurti* b-4183 (NY), 1, 1.0. *Zardini* 7247 (ASU), 1-3, 1.8.

Psidium maribense DC.: *Davidse* & *González* 13083 (MO), 1-5, 3.2; *Davidse* & *González* 14065 (MO), 1, 1.0; *Davidse* & *González* 14709 (MO), 1-4, 3.2.

Psidium missionum Legrand: *Krapovickas* & *Cristóbal* 44607 (ASU), 3-4, 3.4; *Landrum* 5735 (ASU), 3-5, 4.0.

Psidium montanum Sw.: *Harris* 3183 (NY), 3-4, 3.6; *Proctor* 26438 (MICH), 6-10, 7.8; *Proctor* 32738 (NY), 3-7, 5.0.

Psidium multiflorum Cambess.: *Gottsberger & Gottsberger* 11-27990 (ASU), 2-3, 2.4; *Hatschbach* 43388 (ASU), 2-3, 2.6.

Psidium myrsinthes DC.: *Irwin et al.* 9132 (MICH), 2-3, 2.6; *Irwin et al.* 9132 (NY), 4-6, 5.2; *Irwin et al.* 10203 (MICH), 2-4, 2.6; *Maguire et al.* 57100 (MICH), 3, 3.0.

Psidium persoonii McVaugh: *Cid et al.* 746 (CAS), 1-2, 1.6; *De Granville et al.* 9635 (ASU), 3-6, 4.2; *van Donselaar* 3731 (MICH), 1-4, 3.0.

Psidium riparium Martius ex DC.: *Macedo* 4059 (MO), 2-5, 3.2; *Silva* 2715 (MO), 1, 1.0; *Silva* 2715 (NY), 1, 1.0.

Psidium rufum DC.: *Harley* 26373 (ASU), 1-2, 1.4; *Harley et al.* 25891 (ASU), 1, 1.0; *Hatschbach* 15252 (MICH), 1, 1.0; *Williams* 8061 (MO), 4-6, 5.2.

Psidium salutare (Kunth) Berg: *Jansen-Jacobs* 87 (ASU), 1-3, 2.2; *Landrum* 6521 (ASU), 1-3, 1.6; *Liesner & González* 11064 (ASU), 1-3, 1.6; *Zarucchi & Barbosa* 3749 (ASU), 1-3, 2.2.

Psidium sartorianum (Berg) Niedenzu: *Landrum* 6524 (ASU), 3, 3.0; *Silva* 279 (ASU), 3-5, 3.8; *Torres* 9811 (ASU), 1-2, 1.2.

Psidium spatulatum Mattos: *Hatschbach* 17675 (MICH), 1, 1.0; *Hatschbach* 17675 (NY), 1, 1.0.

Psidium striatum DC.: *Dubs* 981 (ASU), 1-2, 1.0; *Ferreira* 9638 (ASU), 2-3, 2.4.

Ugni candollei (Barnéoud) Berg: *Gentry et al.* 53489 (ASU), 1-3, 1.6; *Landrum* 5907 (ASU), 3-5, 4.0; *Landrum* 5909 (ASU), 1-3, 2.0.

Ugni molinae Turcz.: *Landrum* 5881 (ASU), 0-1, 0.8; *Taylor et al.* 10367 (ASU), 0-1, 0.6; *Taylor et al.* 10377 (ASU), 0-1, 0.2.

Ugni myricoides (Kunth) Berg: *Davide et al.* 25949 (ASU), 0-2, 1.0; *Landrum* 6559 (ASU), 1-3, 1.8; *Liesner* 23311 (ASU), 0-1, 0.6; *Méndez* 8385 (ASU), 1-4, 2.0; *Tenorio* 7498 (ASU), 0-2, 0.4.

OLD WORLD MYRTINAE

Decaspermum alpinum P. Royen: *Conn LAE* 69313 (ASU), 1, 1.0.

Decaspermum gracilentum (Hance) Merr. & Pers.: *Kao* 7330 (ASU), 1, 1.0.

Myrtus communis L.: *Lehto* 16884 (ASU), 3, 3.0; *Lehto* 18231 (ASU), 3-7, 5.4; *Poelt s.n.* (ASU), 3-6, 4.8.

Rhodomyrtus tomentosa (Ait.) Hassk.: *Faircloth* 1797 (ASU), 5-8, 6.2.

AMERICAN EUGENIINAE

Calycorectes grandifolius Berg: *Prévost* 1692 (ASU), 16-21, 18.6.

Calycorectes yatuae McVaugh: *Liesner* 16997 (ASU), 1, 1.0.

Eugenia axillaris (Sw.) Willd.: *Glassman* 5018 (ASU), 1-2, 1.6.

Eugenia capuli (Schldl. & Cham.) Berg: *Ventura* 30 (ASU), 1, 1.0.

Eugenia farameoides A. Rich.: *Hernández* 1316 (ASU), 3-4, 3.4.

Eugenia octopleura Krug & Urban ex Urban: *Haber* 758 (ASU), 1, 1.0.

Eugenia oerstedeana Berg: *Ventura* 8106 (ASU), 0-1, 0.4.

Eugenia pseudopsidium Jacq.: *Prévost* 1691 (ASU), 0, 0.0.

Eugenia punicifolia (Kunth) DC.: *Caballero s.n.* (ASU), 1, 1.0.

Eugenia stipitata McVaugh: *Peters* 146 (ASU), 1, 1.0.

Eugenia uniflora L.: *Ortíz* 753 (ASU), 0, 0.0.

Myrcianthes mato (Griseb.) McVaugh: *Landrum* 5772 (ASU), 1, 1.0.

Myrcianthes pungens (Berg) Legrand: *Hatschbach & Hatschbach* 55787 (ASU), 1, 1.0.

Myrcianthes rhopaloides (Kunth) McVaugh: *Solomon* 8653 (ASU), 1, 1.0.

Myrciaria cordifolia Legrand: *Cordeiro* 344 (ASU), 0, 0.0.

Myrciaria delicatula (DC.) Berg: *Krapovickas & Schinini* 38202 (ASU), 0-1, 0.8.

Myrciaria floribunda (West ex Willd.) Berg: *Hatschbach* 54928 (ASU), 1, 1.0.

Neomitranthes glomerata (Legrand) Legrand: *Hatschbach* 19578 (ASU), 0, 0.0.

AMERICAN MYRCIINAE including the anomalous genus *Luma* that may or may not belong to this subtribe

Calyptranthes amshoffae McVaugh: *Larpin* 846 (ASU), 0, 0.0.

Calyptranthes concinna DC.: *Cordeiro* 688 (ASU), 1, 1.0.

Calyptranthes longifolia Berg: *Wallnöfer* 11-13788 (ASU), 0, 0.0.

Luma apiculata (DC.) Burret: *Landrum* 5872 (ASU), 0, 0.0.

Luma chequem (Molina) A. Gray: *Gardner* et al. 4427 (ASU), 0, 0.0.

Myrciaria campestris (DC.) Legrand & Kausel: *Hatschbach* 52288 (ASU), 0, 0.0.

Myrciaria chrysocarpa (Berg) Kausel: *Gardner* 3503 (ASU), 1, 1.0.

Myrciaria miersiana (Gardner) Legrand & Kausel: *Kummrow* 2904 (ASU), 1, 1.0.

Myrciaria myrcioides (Cambess.) Berg: *Silva* 313 (ASU), 1, 1.0.

Myrciaria obtusa (DC.) Berg: *Landrum* 8214 (ASU), 1, 1.0.

Myrcia calyptanthoides (Berg) Mattos: *Hatschbach* 53588 (ASU), 1, 1.0.

Myrcia citrifolia (Aublet) Urban: *Pirani* 1221 (ASU), 1, 1.0.

Myrcia cuprea (Berg) Kjaerskov: *Mori* et al. 17512 (ASU), 0-1, 0.6.

Myrcia fallax (A. Rich.) DC.: *Sobel* et al. 4580 (ASU), 1, 1.0.

Myrcia guianensis (Aublet) DC.: *Lewis* et al. SPF 36940, CFCR 7140 (ASU), 1, 1.0.

Myrcia saxatilis (Amshoff) McVaugh: *Larpin* 740 (ASU), 1, 1.0.

OLD WORLD LEPTOSPERMACEAE

Chamaelaucium uncinatum Schauer: *Earle* 23 (ASU), 1, 1.0.

Choricarpia leptopetala (F. Muell.) Domin: *Coveny* 15872 (ASU), 1, 1.0.

Metrosideros fulgens Gaertn.: *Weston* 1192 (ASU), 0, 0.0.

Metrosideros polymorpha Gaud.: *Clements* 17 (ASU), 5-8, 6.0.